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June 3, 2019

VIA ELECTRONIC FILING

The Honorable Jocelyn G. Boyd
Chief Clerk/Administrator
Public Service Commission of South Carolina
101 Executive Center Drive, Suite 100
Columbia, SC 29210

RE: Petition of Duke Energy Carolinas, LLC and Duke Energy Progress, LLC for Approval of CPRE Queue Number Proposal, Limited Waiver of Generator Interconnection Procedures, and Request for Expedited Review Docket No. 2018-202-E

Dear Ms. Boyd:

Duke Energy Carolinas, LLC ("DEC") and Duke Energy Progress, LLC ("DEP") (collectively, the "Companies" or "Duke") hereby respectfully submit the Companies' report on the ongoing Interconnection Queue Reform Stakeholder Process as required by the Public Service Commission of South Carolina's ("Commission") Order No. 2019-247 issued in the above-captioned docket.

The Companies' Interconnection Queue Reform Stakeholder Process was initiated earlier this year to discuss potential solutions to more effectively manage the unprecedented number of proposed transmission- and utility-scale distribution-connected generating facilities requesting interconnection across the Companies' South Carolina and North Carolina service territories. The Companies retained Navigant Consulting, a third-party consulting firm, to facilitate the Interconnection Queue Reform Stakeholder Process. Duke convened an initial Stakeholder Kickoff Meeting on March 28, 2019. A second stakeholder meeting was held on April 25, 2019, where the Companies presented an initial framework for interconnection queue reform. Over 100 stakeholders attended either one or both of these initial meetings, with attendees including the Office of Regulatory Staff, the North Carolina Utilities Commission—Public Staff, and various other stakeholders as well as a number of South Carolina renewable energy developer representatives. Following these initial meetings, stakeholders were allowed to submit written comments regarding the stakeholder discussions and the Companies' queue reform strategies and proposals. The Companies have also published information about the stakeholder meetings on Duke's OASIS website available online at: https://www.oasis.oati.com/duk/index.html.

The Companies are now in the process of developing detailed proposals to reform aspects of their South Carolina, North Carolina, and Federal interconnection procedures and generator interconnection queueing processes, taking into consideration stakeholder comments received through these initial meetings. The Companies plan to present these preliminary proposals for discussion with other stakeholders at the next stakeholder meeting, which is currently scheduled for June 18, 2019. After receiving stakeholder feedback and input during this third meeting, another stakeholder meeting is planned to receive comments on additional queue reform proposals. The Companies tentatively plan to finalize and file their queue reform proposals for Commission approval in the Fall of 2019.

The Companies are also enclosing the presentations from the March 28, 2019 and April 25, 2019 meetings to provide a more detailed account of the ongoing Interconnection Queue Reform Stakeholder Process.

Should you have any questions regarding this matter, please do not hesitate to contact me at 803. 988.7130.

Sincerely,

Rebecca J. Dulin

Enclosures

cc: Parties of record

Interconnection Queue Reform

Stakeholder Kickoff Meeting

March 28, 2019

Agenda

- Introductions
- Background & Objectives
- Ground Rules
- Guiding Principles
- Potential Scenarios & Benchmarking
- Timeline
- Feedback
- Next Steps

Current Situation

- **Growing Queue** – The increasing size of the interconnection queue is creating challenges for both Duke Energy and developers that are not readily solvable under the existing processes
- **Increasing Interdependencies –** Solar penetration levels are increasingly resulting in interdependencies between transmission and distribution requests
- **Network Upgrades Increasingly Triggered –** Due to the level of successful interconnections achieved to date, interconnection requests are becoming increasingly likely to trigger substantial network upgrades
- **Cost Sharing Mechanism -** The existing serial process prevents developers from sharing costs when large upgrades are required creating both market and system congestion
- **Growing Interest in Cluster Studies –** Support is growing amongst utilities and FERC to move to a "first ready/first served" policy in managing the SGIP and LGIP queue process

Objectives & Charter

- Objectives
  - Increase efficiency of interconnection process and reduce size of interconnection queue
  - Meet North Carolina (NC) commitment to pursue Queue Reform and propose workable framework
  - Explore a common interconnection planning study approach for NC, SC, FL, and FERC
  - Align the rules and workflows by which both transmission and distribution level projects are assessed
  - Develop a workable Interconnection Process by removing bottlenecks that cause queue backlogs

- Charter Statement
  - The Interconnection Reform Stakeholder Process will examine existing queue processes and suggest modifications for improving efficiency and effectiveness, including the development of a proposal for a grouping study process. Duke Energy and stakeholders will consider industry best practices and any specific regional requirements in developing proposed changes that position the Companies to facilitate achievement of future renewable energy policy objectives.

Ground Rules

- All Stakeholder Group meetings, webinars and information exchange are designed solely to provide an open forum or means for the expression of various points of view in compliance with antitrust laws.

- Under no circumstances shall Stakeholder Group activities be used as a means for competing companies to reach any understanding, expressed or implied, which tends to restrict competition, or in any way, to impair the ability of participating members to exercise independent business judgment regarding matters affecting competition or regulatory positions.

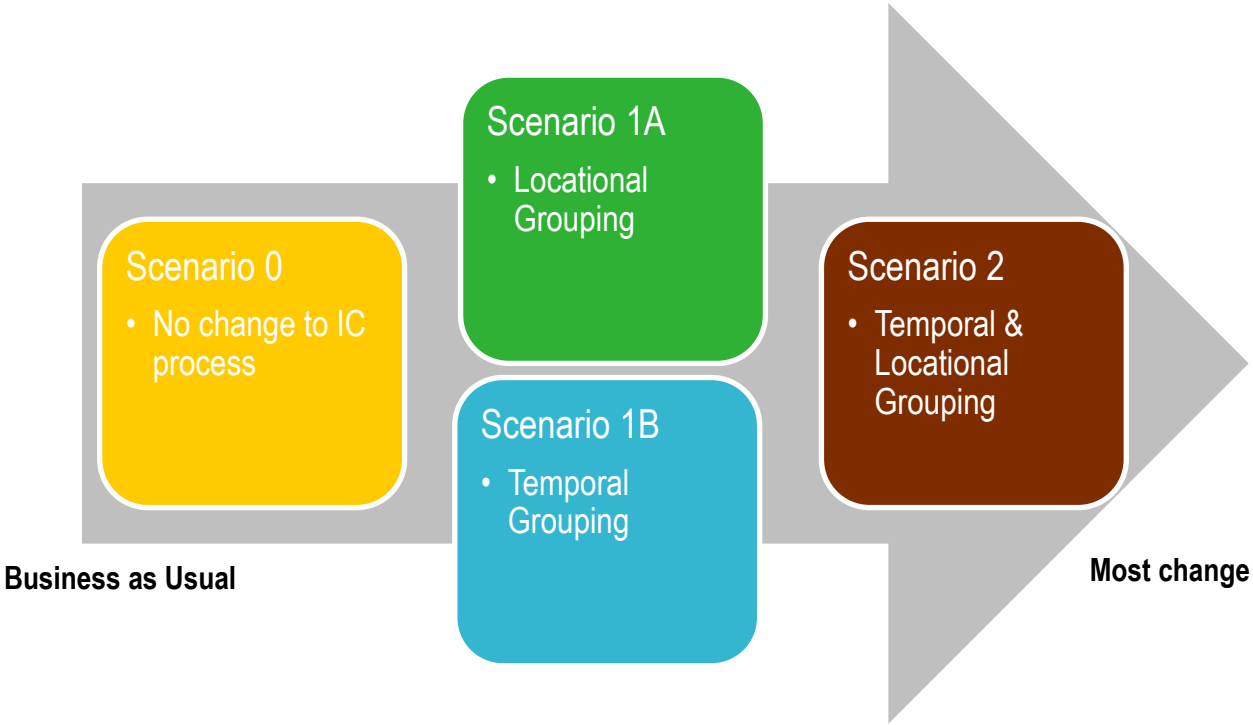
- Proprietary information shall not be disclosed by any participant during any group meetings. In addition, no information of a secret or proprietary nature shall be made available to Stakeholder Group members.

- All proprietary information which may nonetheless be publicly disclosed by any participant during any group meeting shall be deemed to have been disclosed on a non-confidential basis, without any restrictions on use by anyone, except that no valid copyright or patent right shall be deemed to have been waived by such disclosure.

Guiding Principles

- Effective processing of interconnection requests is fundamental to facilitating development of additional renewable resources
- Stakeholder input provides valuable insight to guide queue reform process development
- Other regions undergoing queue reform provides valuable insights and lessons learned
- Proposed changes must respect legal and PURPA requirements and constraints
- Proposed process changes must be developed and administered in a fair, objective, and expeditious manner

Potential Scenarios

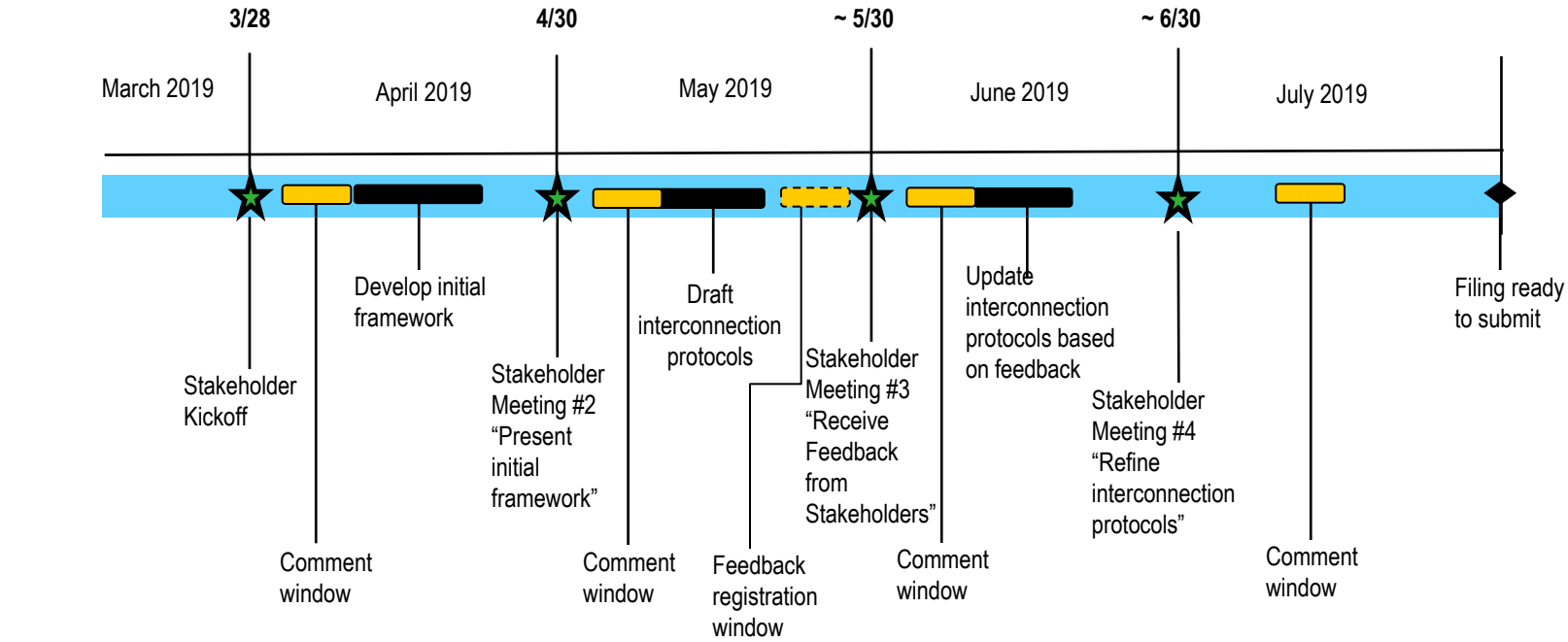


Preliminary Draft, for discussion purposes only

Utilities and RTOs Implementing Cluster Studies – Status

- PNM converted to grouping study process in 2011
  - Queue reduced from 10,000MW to roughly 1,000MW on a 2,500MW system
  - Most project proposals intend to wheel to the CAISO or elsewhere
- Public Service Colorado (PSCO) has 23,000MW and a 6,500MW system
  - Projects are large wind and solar and generally are not QFs or PURPA eligible
  - FERC recently denied request for Queue Reform changes
  - Next steps include Order 845 filing and refiling of Queue Reform
- MISO grouping study process takes 2 years or more
  - FERC recently rejected MISO's proposal to implement more stringent developer conditions and requested with certain revisions for approval
- SPP grouping process can take any where between 12 to 36 months depending the location of the study and chosen process
  - Due to long delays, SPP is considering revising the current grouping study process
  - SPP's proposed timeline is 485 days from initiating the study to the LGIA, with no optional study periods
- CAISO grouping process takes 24 months approximately
  - Current initiative is to revise the GIA process

2019 Queue Reform Stakeholder Process Timeline*



*This timeline may be adjusted based on filing requirements

Next Steps

- 4/8 - Queue Reform Team to publish meeting notes and information on how stakeholders can provide feedback and comments regarding kickoff meeting presentation
- 4/16 - Stakeholders to provide feedback and questions regarding process objectives, guidelines or timeline
- 4/16 - Queue Reform Team to send invitation for Stakeholder meeting #2 (tentatively 4/30)
- 4/26 - Queue Reform Team to provide initial Queue Reform framework to stakeholders
- 4/30 - Stakeholder Meeting #2 to discuss initial framework
- Others?

Duke Energy Generator Interconnection

Queue Reform Stakeholder Meeting #2

April 25, 2019



DUKE ENERGY®

Agenda

Topic	Presenter	Time
Overview and Orientation	Navigant Consulting	10:00 – 10:10
Interconnection Queue: Current State Overview	Duke Energy	10:10 – 10:30
Queue Reform: National Trends and Emerging Best Practices	Navigant Consulting	10:30 – 11:00
Break		11:00 – 11:15
Queue Reform: Framework	Duke Energy	11:15 – 12:30
Lunch		12:30 – 1:00
Reconvene	Navigant Consulting	1:00 – 1:10
Facilitated Sessions and Break	All	1:10 – 2:30
Next Steps	Navigant Consulting	2:30 – 2:45

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Guiding Principles

- Effective processing of interconnection requests is fundamental to facilitating development of additional renewable resources
- Stakeholder input provides valuable insight to guide queue reform process development
- Other regions undergoing queue reform provide valuable insights and lessons learned
- Proposed changes must conform with applicable law and regulations
- Proposed process changes must be developed and administered in a fair, objective, and expeditious manner

Charter

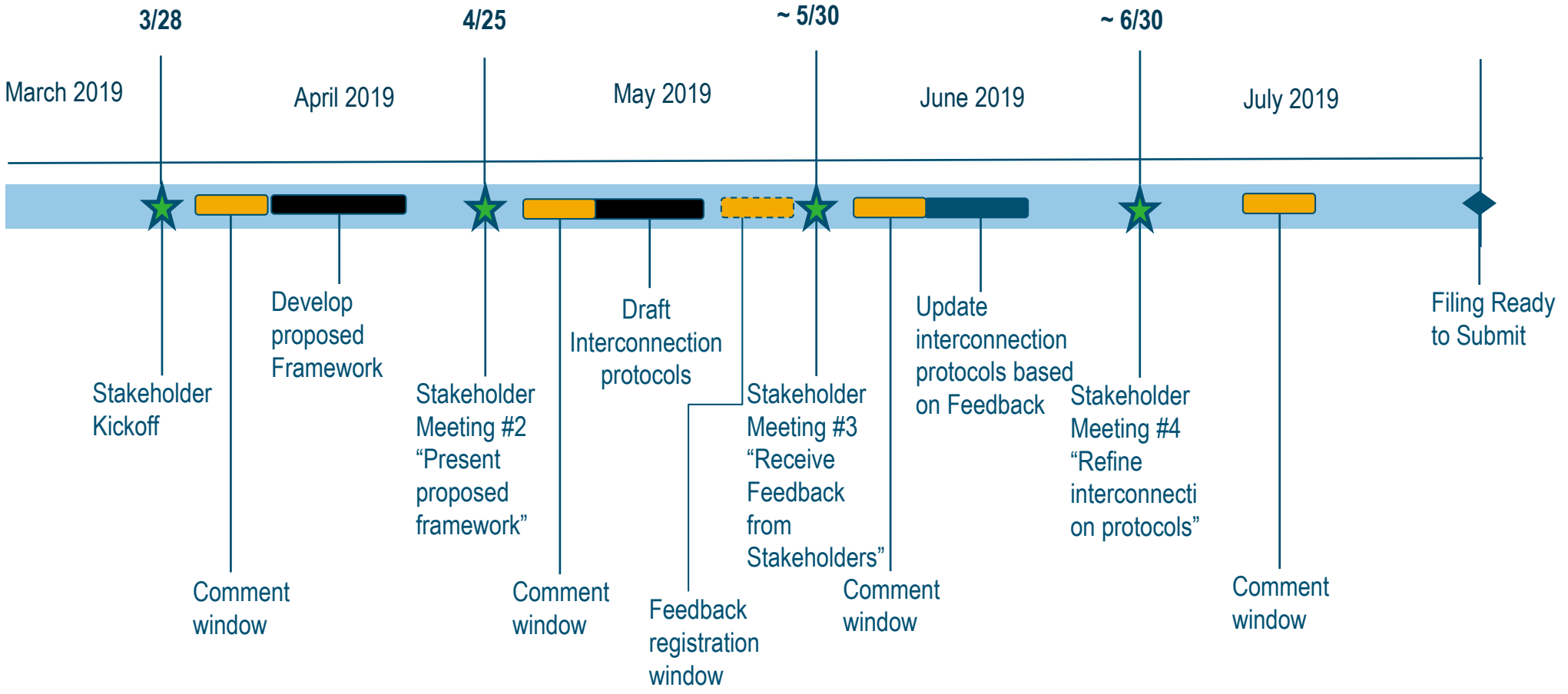
- The Interconnection Reform Stakeholder Process will examine existing queue processes and suggest modifications for improving efficiency and effectiveness, including the development of a proposal for a grouping study process.

- Duke Energy and stakeholders will consider industry best practices and any specific regional requirements in developing proposed changes that position the Companies to facilitate achievement of future renewable energy policy objectives.

Logistics

- Today's presentation will be distributed
- Clarifying questions will be answered at the end of each section
- We will collect questions throughout the day
  - We will collect feedback cards throughout the day
  - We will collect questions from those attending in person, by phone and by Webex
- We will take a morning break and a lunch break
- Afternoon facilitated session to receive additional feedback and comments

2019 Queue Reform Stakeholder Process Timeline*

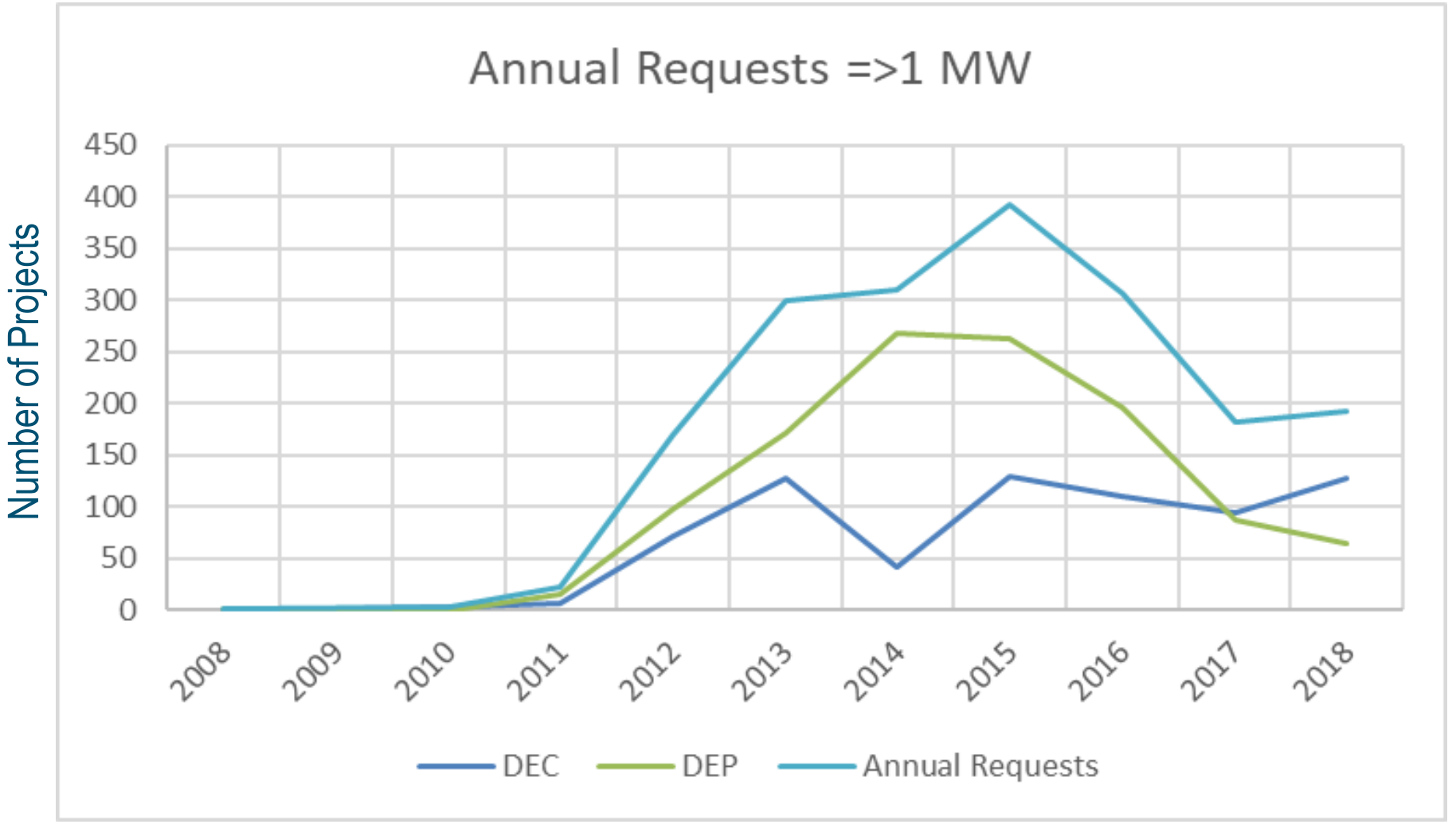


*This timeline may be adjusted based on filing requirements

INTERCONNECTION QUEUE: CURRENT STATE OVERVIEW

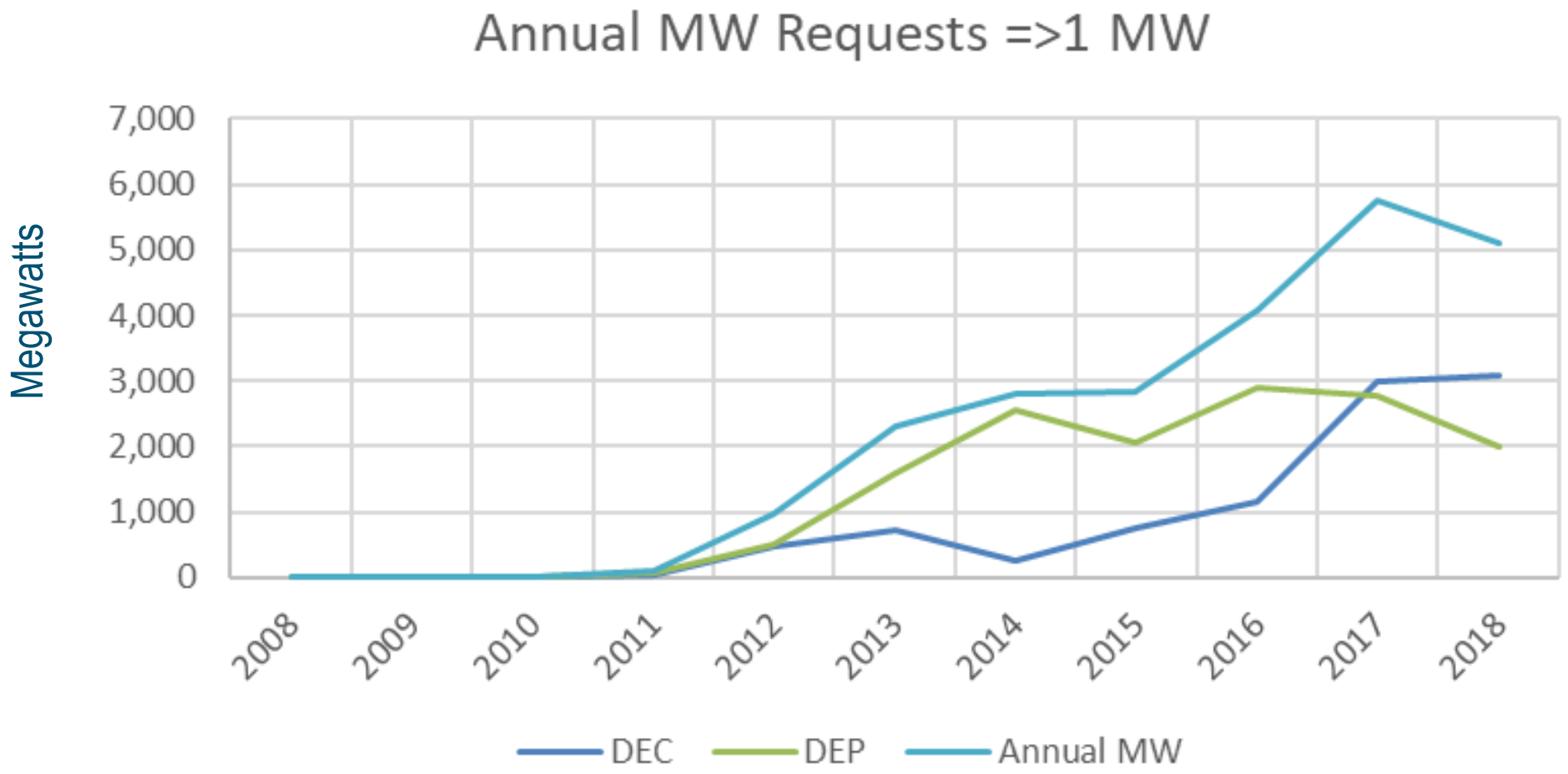
Current State: DEP & DEC Interconnection Requests

Average of 280 utility scale requests per year since 2013

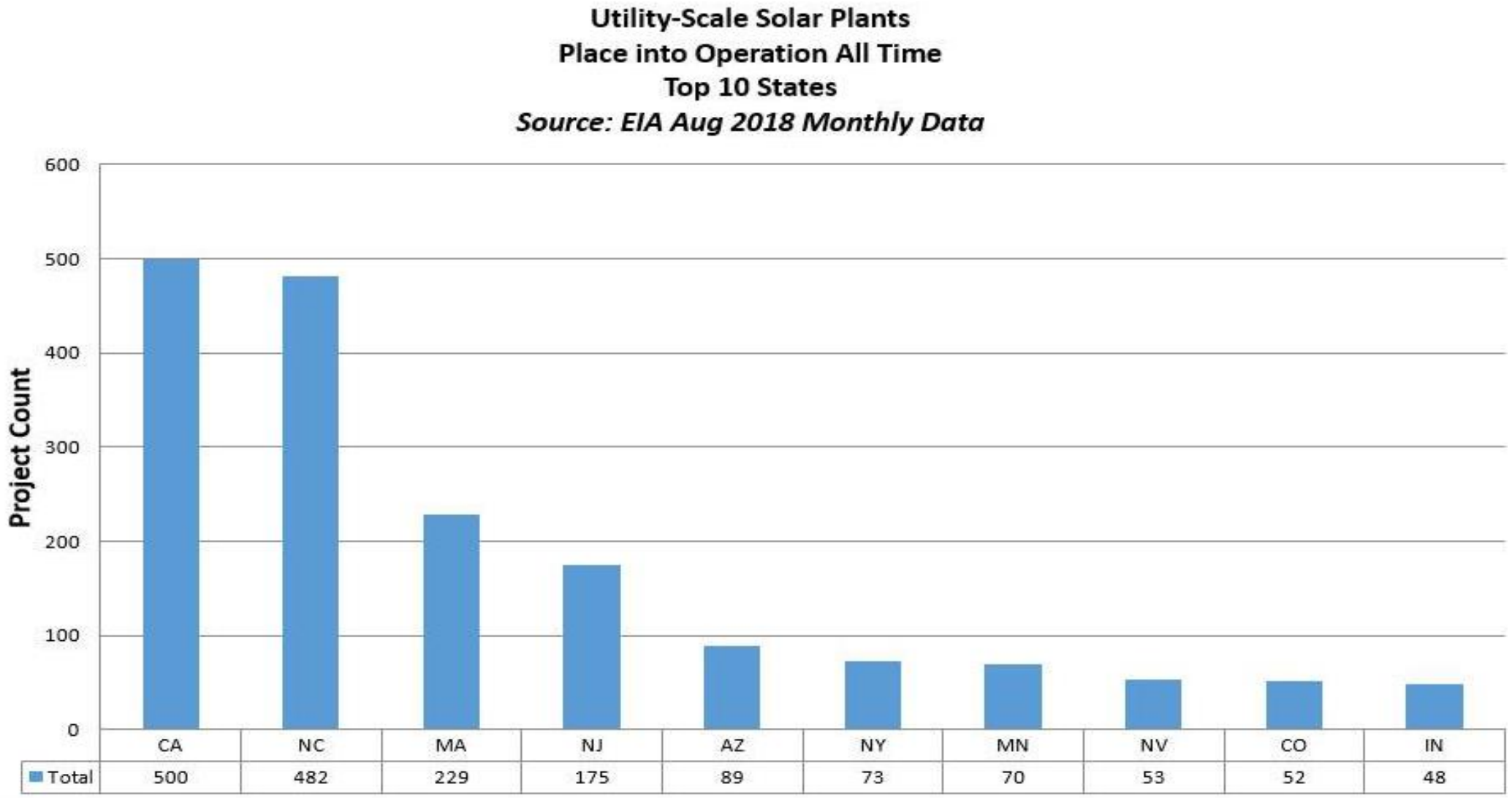


Current State: DEP & DEC Interconnection Requests (MW)

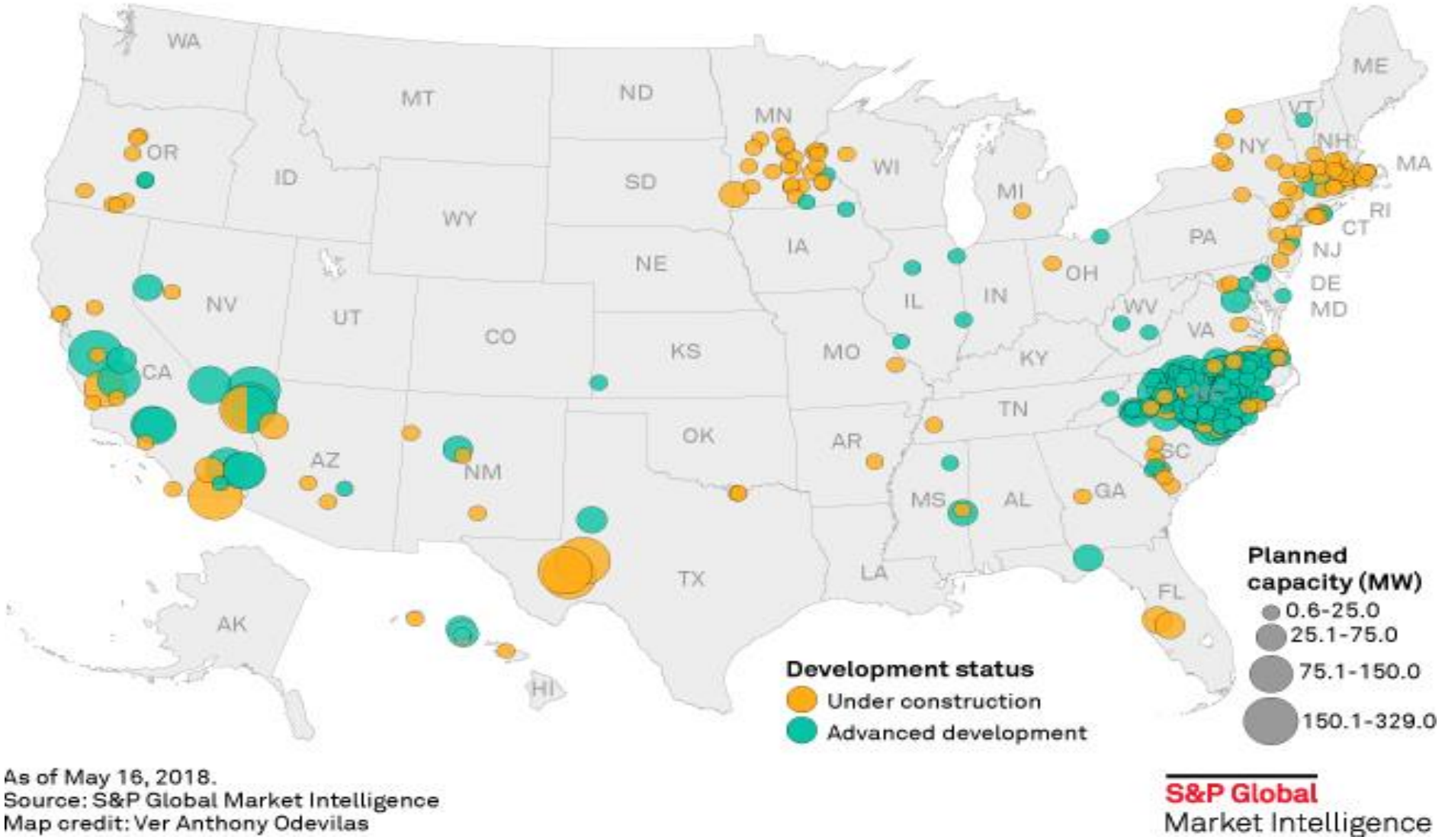
Total of 22,843 MW of requests since 2013



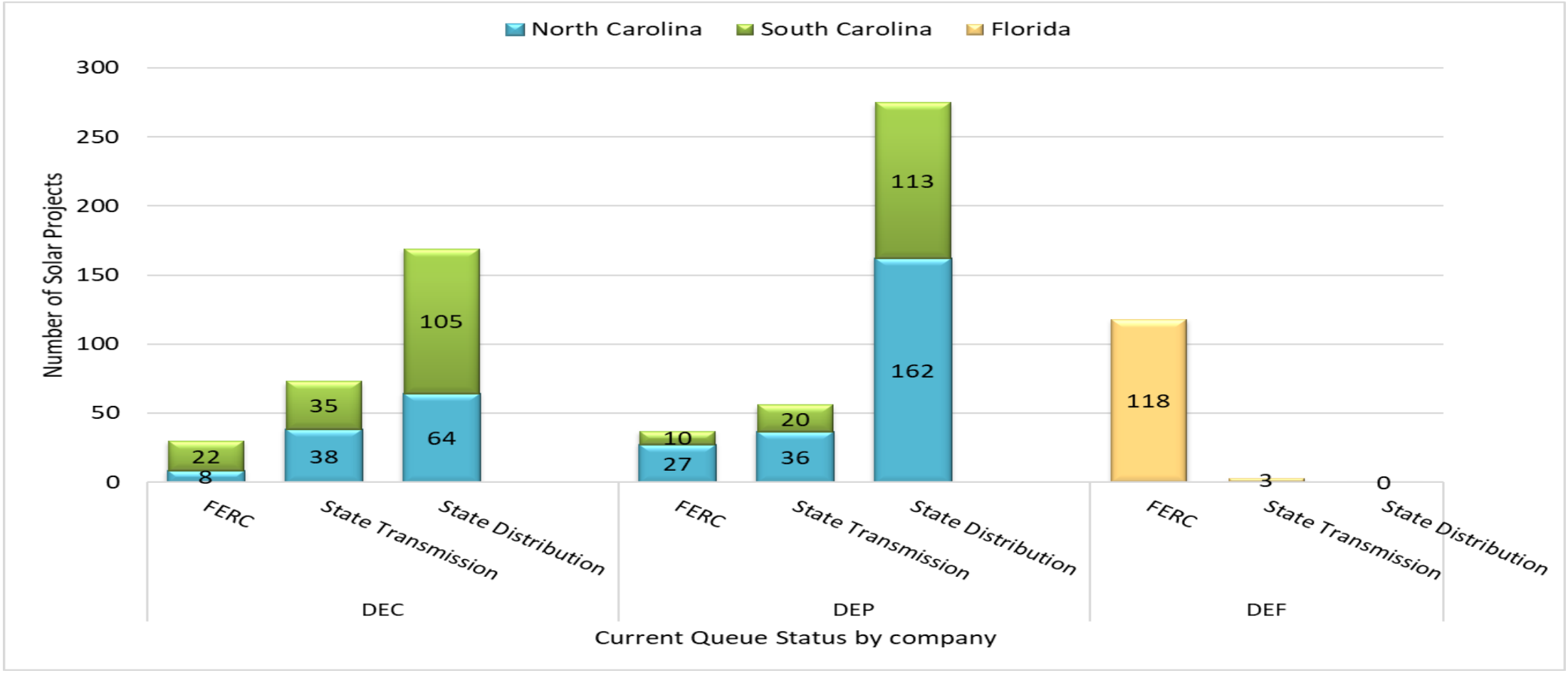
Utility Scale (>1 MW) Solar Projects Connected



U.S. Planned Solar Projects



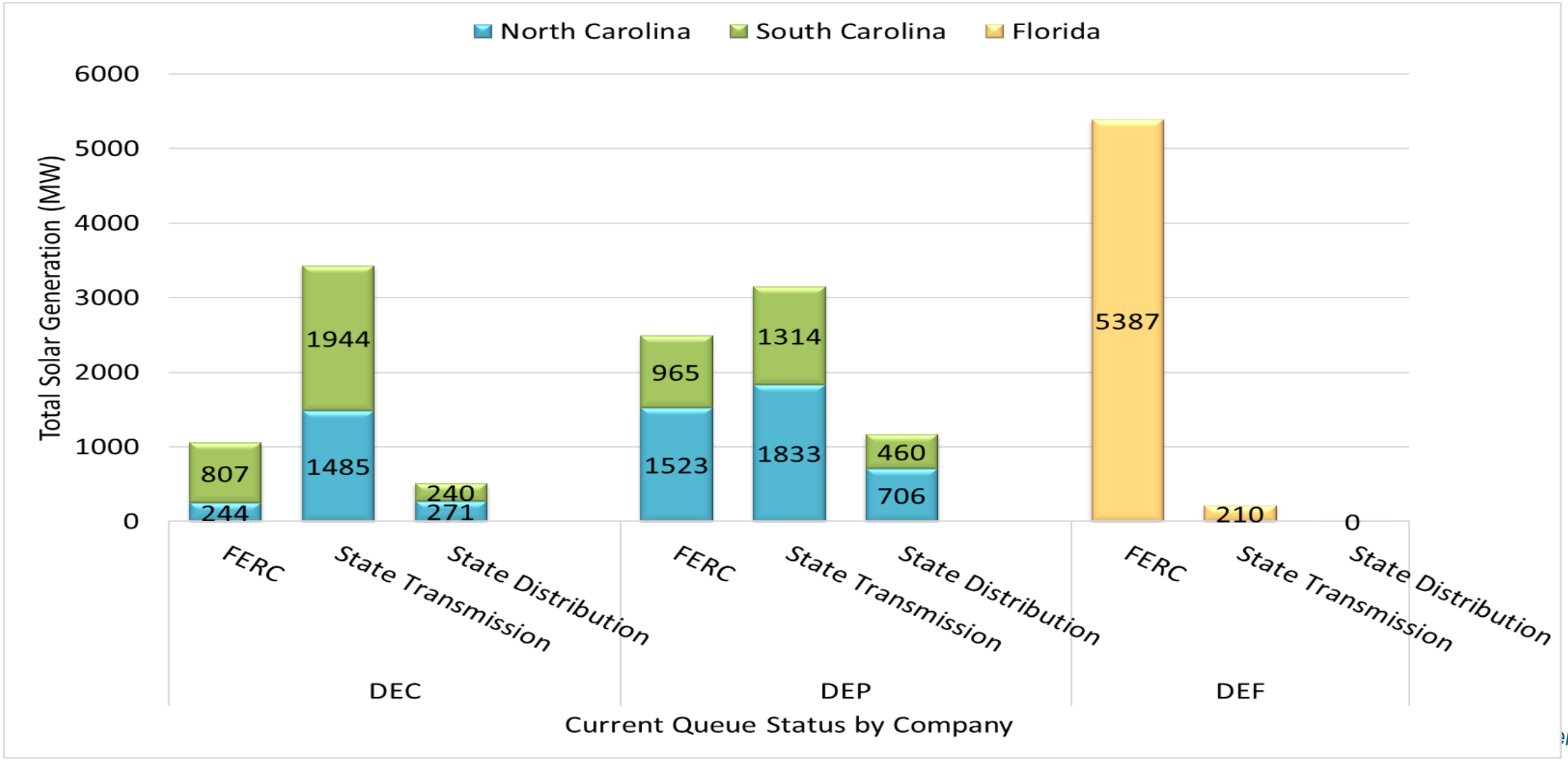
Current Status: FERC & State Queues (Projects)



**Current Queue Status representative for projects 1 MW or larger*

Interconnection Status as of 4/2019

Current Status: FERC & State Queues (MWs)



*Current Queue Status representative for projects 1 MW or larger

Current State: A Case for Queue Reform

Growing Queue	The increasing size of the interconnection queue is creating challenges for both Duke Energy and developers that are not readily solvable under the existing processes
Increasing Interdependencies	Solar penetration levels are increasingly resulting in interdependencies between transmission and distribution requests as well as FERC and State projects.
Network Upgrades Increasingly Triggered	Due to the level of successful interconnections achieved to date, interconnection requests are becoming increasingly likely to trigger substantial network upgrades.
Cost Sharing Mechanism	The existing serial process prevents developers from sharing costs when large upgrades are required creating both market and system congestion
Growing Interest in Cluster Studies	Support is growing amongst utilities and FERC to move to a “first ready/first served” policy in managing the SGIP and LGIP queue process

Current State: Interconnection Queue Interdependency Example

Substation 1

- State Project A 02/2015
- State Project B 09/2017

Substation 2

- State Project A 06/2014
- State Project B 10/2015
- On Hold 12/2016
- On Hold 01/2019

FERC Project 01/2015

State Project Transmission* 05/2015

* Transmission assessment:
The determination of this project as an "A" on the Transmission System is complicated by:

(1) The total loading impact of Substation 1, 2, & 3 on the Transmission System.

AND

(2) The inclusion of a FERC Project not subject to state interdependency policy on the Transmission System.

Interconnection Queue Reform Objectives

- Increase efficiency of interconnection process and reduce size of interconnection queue
- Meet North Carolina (NC) commitment to pursue queue reform and propose workable framework
- Explore a common interconnection planning study approach for FERC jurisdictional and State jurisdictional projects
- Align the rules and workflows by which both transmission and distribution level projects are assessed
- Develop an improved interconnection process by removing bottlenecks that cause queue backlogs
- Continue to ensure reliable and safe transmission and distribution systems that comply with NAESB, FERC, NERC, NESC, NEC, NC, SC, and FL standards

QUEUE REFORM: NATIONAL TRENDS AND EMERGING BEST PRACTICES

Topics

- Review select regions undergoing queue reform
  - Public Service of New Mexico Queue Reform
  - Xcel Energy, Colorado Queue Reform
  - MISO and SPP Queue Processes
  - California Transmission & Distribution Queue Processes
- Evolving Interconnection Process

PUBLIC SERVICE OF NEW MEXICO (PNM) QUEUE REFORM

PNM queue challenge before 2011 reform

- PNM had 44 requests totaling 14,918 MW in a balancing authority area with a historic peak load of only 2,600 MW

PNM proposed reforms to:

- Create a fast-track approach for projects that meet specific milestones
- Encourage more speculative/potentially non-viable projects to enter into a preliminary queue
- Discourage potentially non-viable projects from entering the final queue by increasing deposits and requiring project readiness milestones

FERC acceptance

- PNM's tariff revisions on Sept 30, 2011 in ER11-3522

PUBLIC SERVICE OF NEW MEXICO (PNM) QUEUE REFORM

PNM established two interconnection cluster study queues:

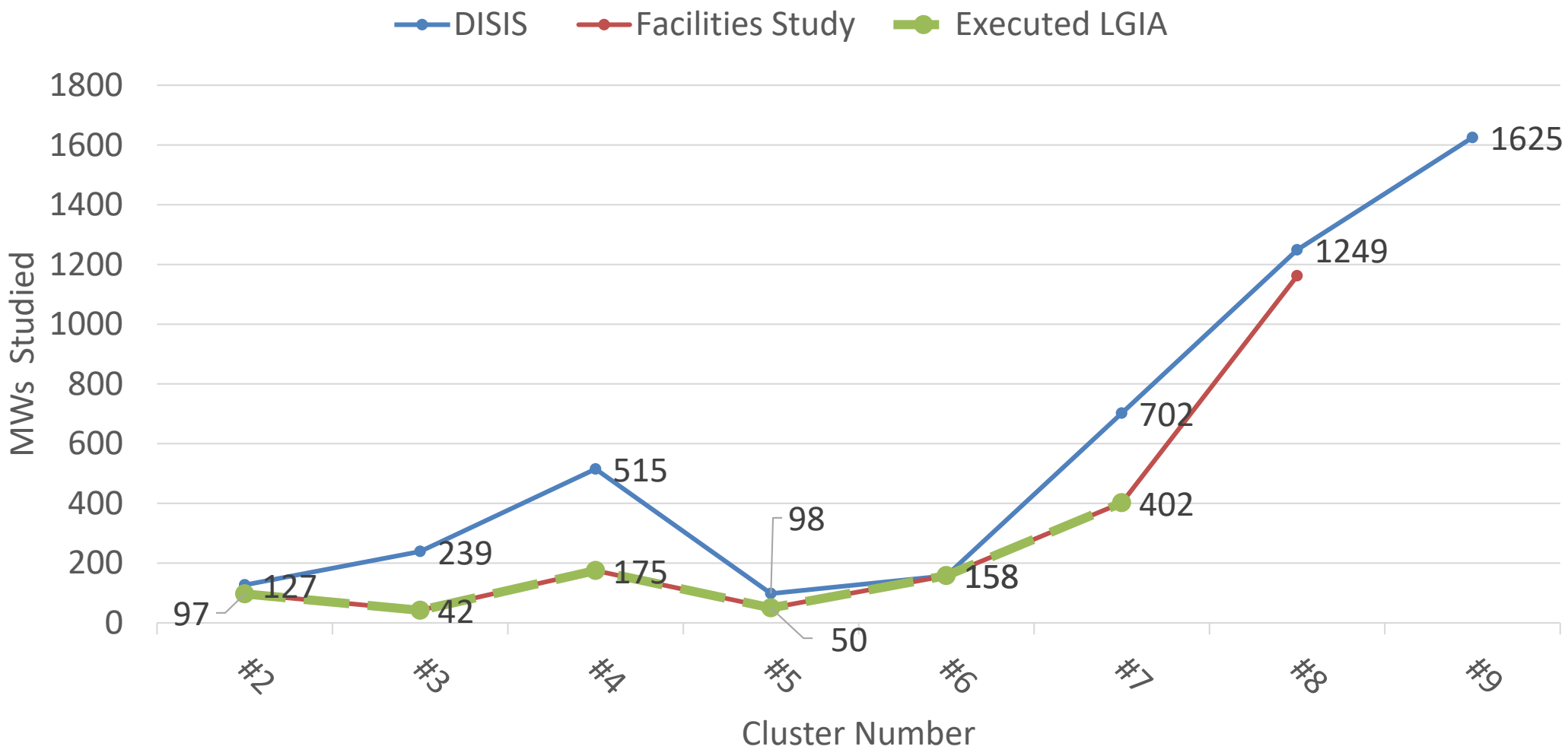
Preliminary Interconnection System Impact Study Queue

- Does not lead directly to a Large Generation Interconnection Agreement (LGIA), but provides information to projects in order to help them determine definitive size and interconnection point for DISIS application
- This process is applicable for projects that need more information and time before they are ready to interconnect

Definitive Interconnection System Impact Study (DSIS) Queue

- Requires increased deposits or evidence of commercial viability
  - $2000/MW at the System Impact Study Stage
  - Study deposit increases to the estimated upgrade cost at the Facilities Study Stage
  - Acceptable evidence includes: purchase agreement, inclusion in a state resource plan, designated network resource, etc
- Leads to an LGIA

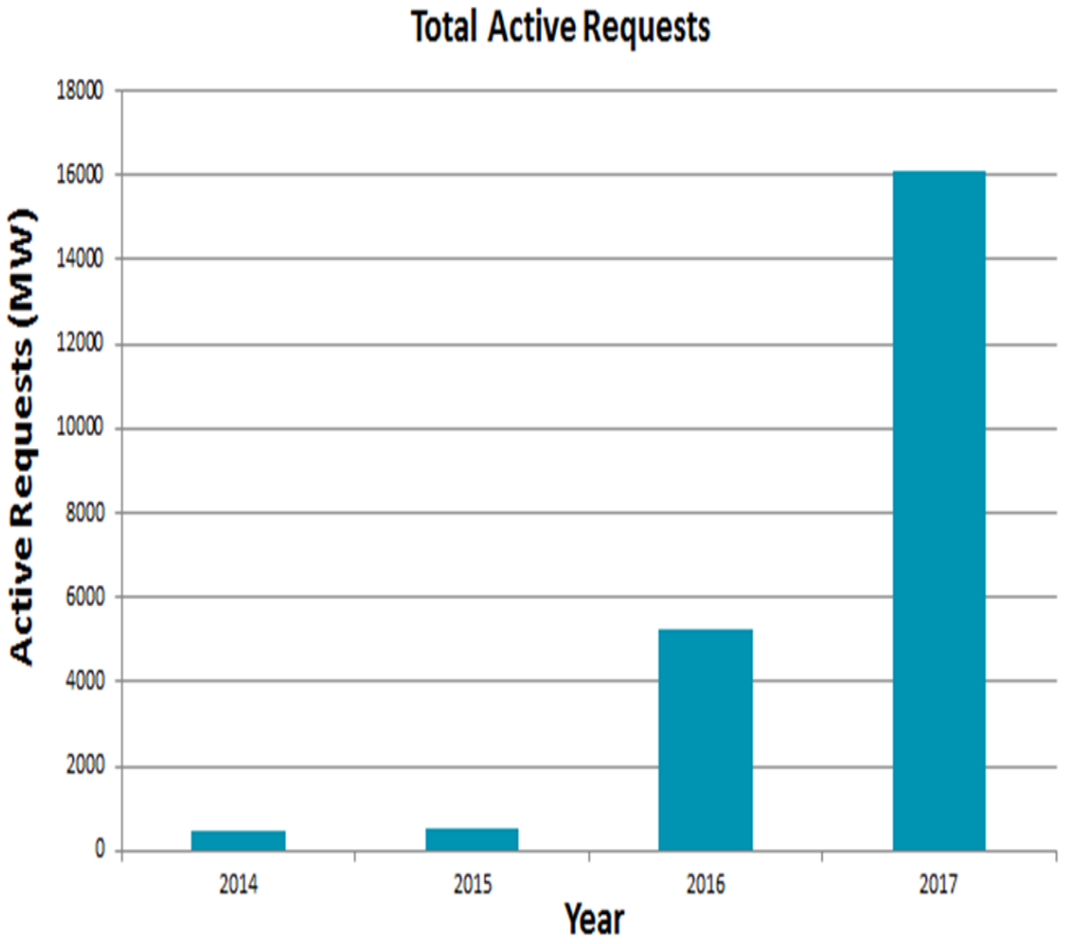
PNM Reforms resulted increased viable projects executing LGIA



XCEL ENERGY COLORADO - QUEUE REFORM

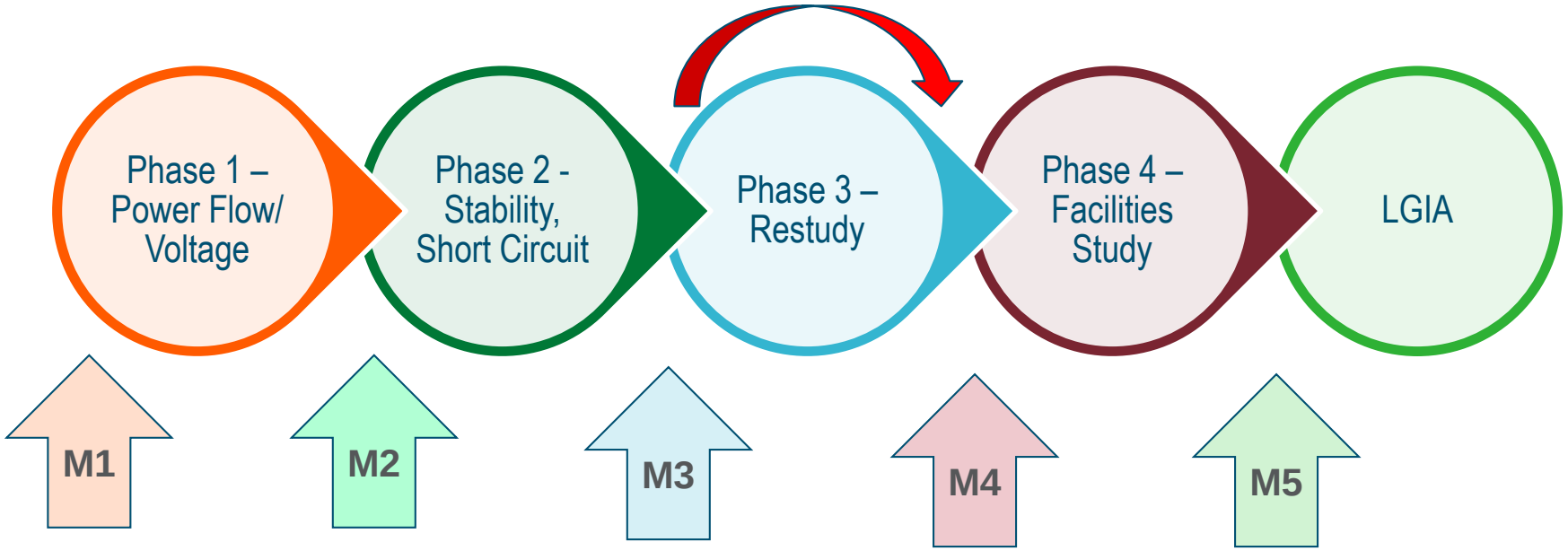
PSCO Challenge

- ~23,000 MW of pending requests for a ~8,500 MW BAA peak load
- Almost all requests are full deliverability
- Challenging to study lower queued project due to load and generation mismatch
- The volume requires a more streamlined process that allows viable projects to move forward



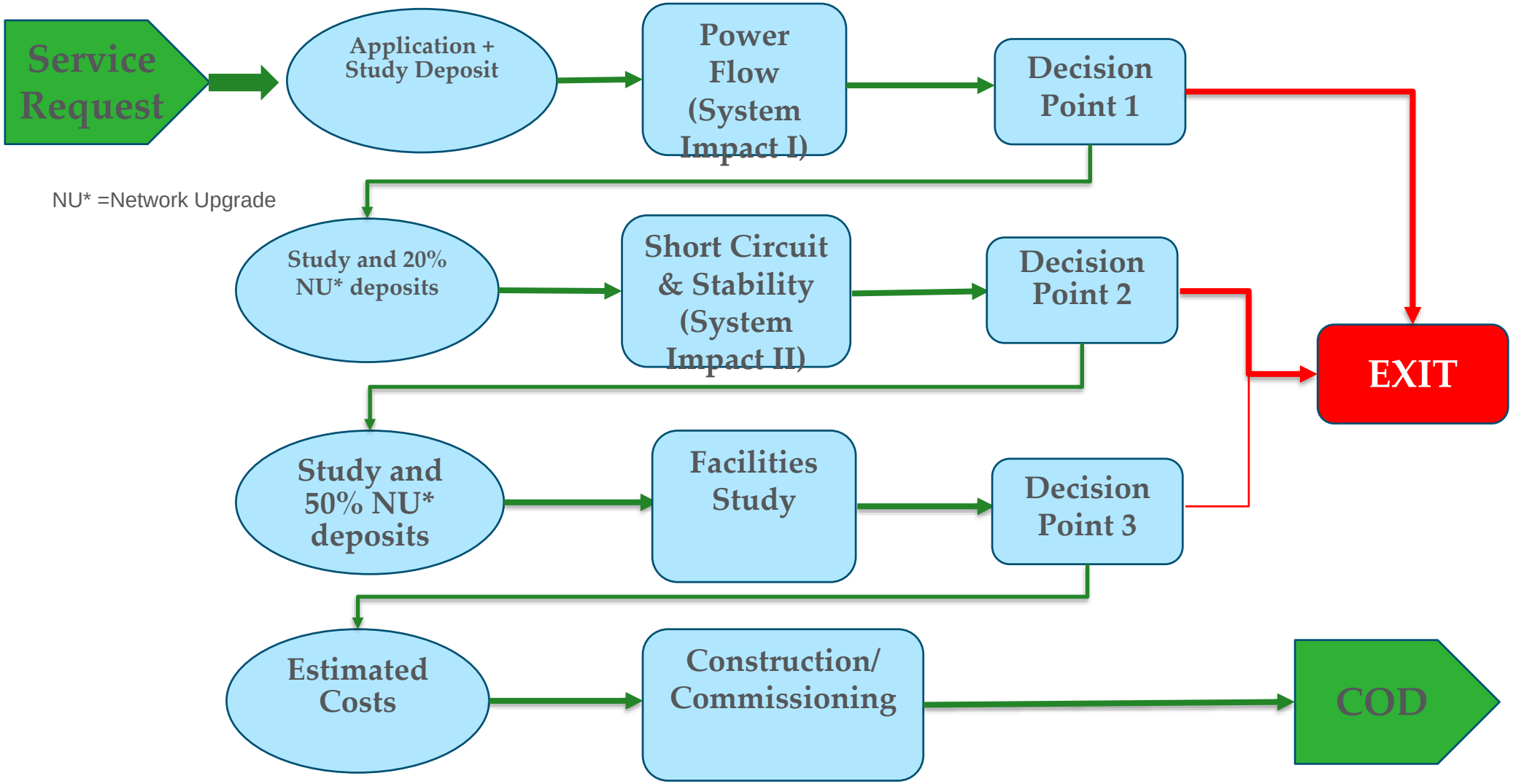
Source: Xcel Energy, PSCO Queue Reform Stakeholder Meeting, May 18, 2018

XCEL ENERGY COLORADO - QUEUE REFORM



- PSCO proposed process is very similar to PNM process
- No Preliminary Cluster Study but includes optional studies
- Restudies are conducted as needed

MISO and SPP QUEUE PROCESS OVERVIEW

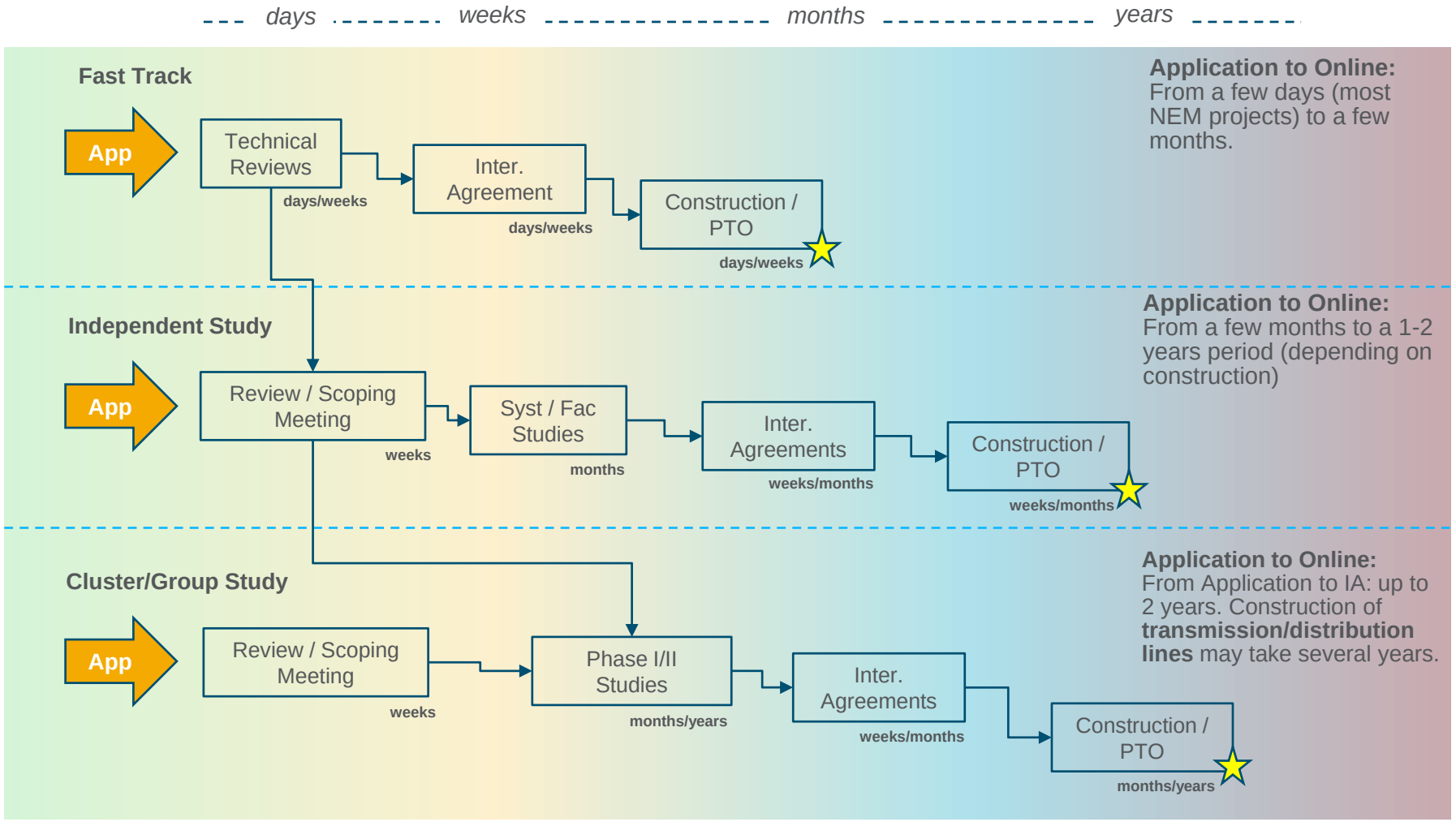


CALIFORNIA T&D INTERCONNECTION PROCESS

	Transmission Projects	Distribution Projects	
Jurisdiction	FERC Jurisdiction	FERC Jurisdiction	State Jurisdiction
Interconnection Process	CAISO GIA	Wholesale Distribution Tariff Agreement (WDAT)	Rule 21 Export Agreement
KV Level	At 60 KV or above*	Less than 60KV*	Less than 60 KV*
General Applicability	Generators interconnecting to transmission system (facilities under CAISO's control)	Generators interconnecting to distribution system selling energy to utility, CAISO or any 3rd party	Qualifying Facilities interconnecting to distribution system and selling their output to utility

- If Distribution has impact on Transmission it will be studied by CAISO
- Utility specific KV levels apply

SOUTHERN CALIFORNIA EDISON INTERCONNECTION PROCESS

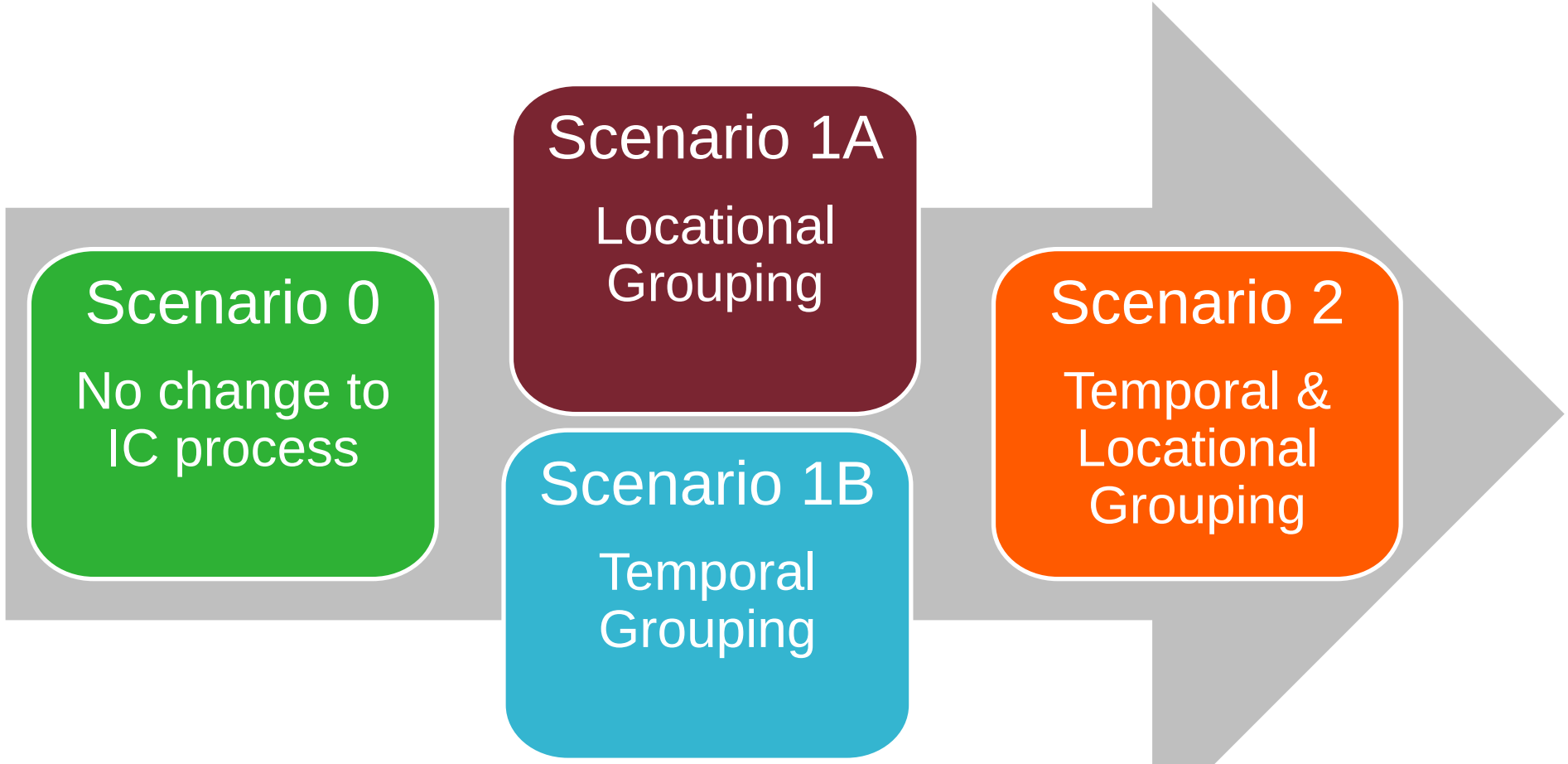


Fast Track – Projects with no impact

Independent Study – With distribution impact only

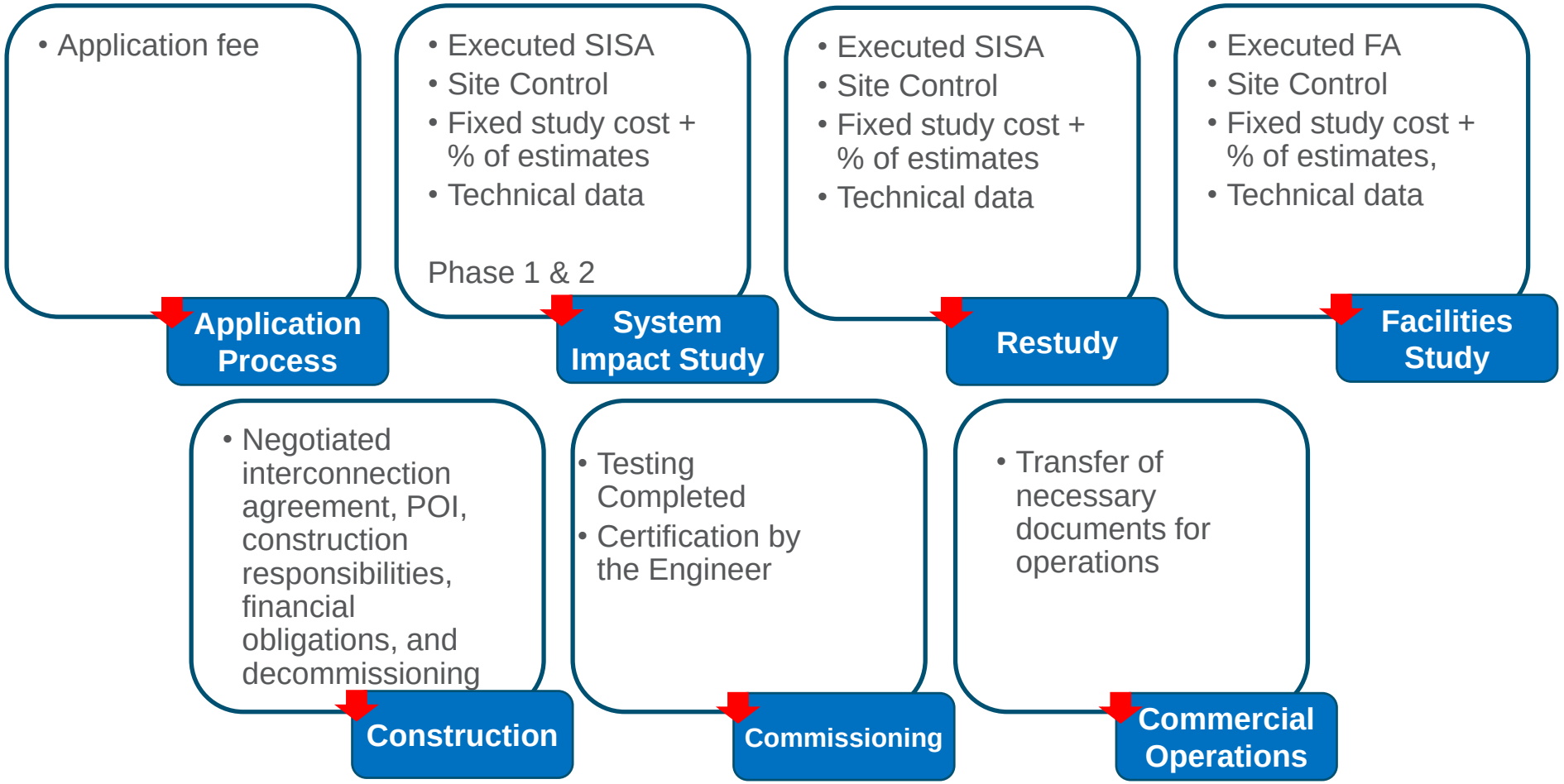
Cluster Study – Both Transmission and Distribution Impact

SCENARIOS BY LEVEL OF CHANGE



INDUSTRY EVOLVING INTERCONNECTION PROCESS

What gets you in? What gets you through? Deposit and milestones requirements for each step?



QUEUE REFORM FRAMEWORK

Proposed Future State: T&D Cluster Study Benefits

Process Improvement

- Process all interconnection requests simultaneously included in one cluster on a concurrent basis
- Efficiently identify, coordinate, and process projects that do not adversely impact the Duke T&D systems

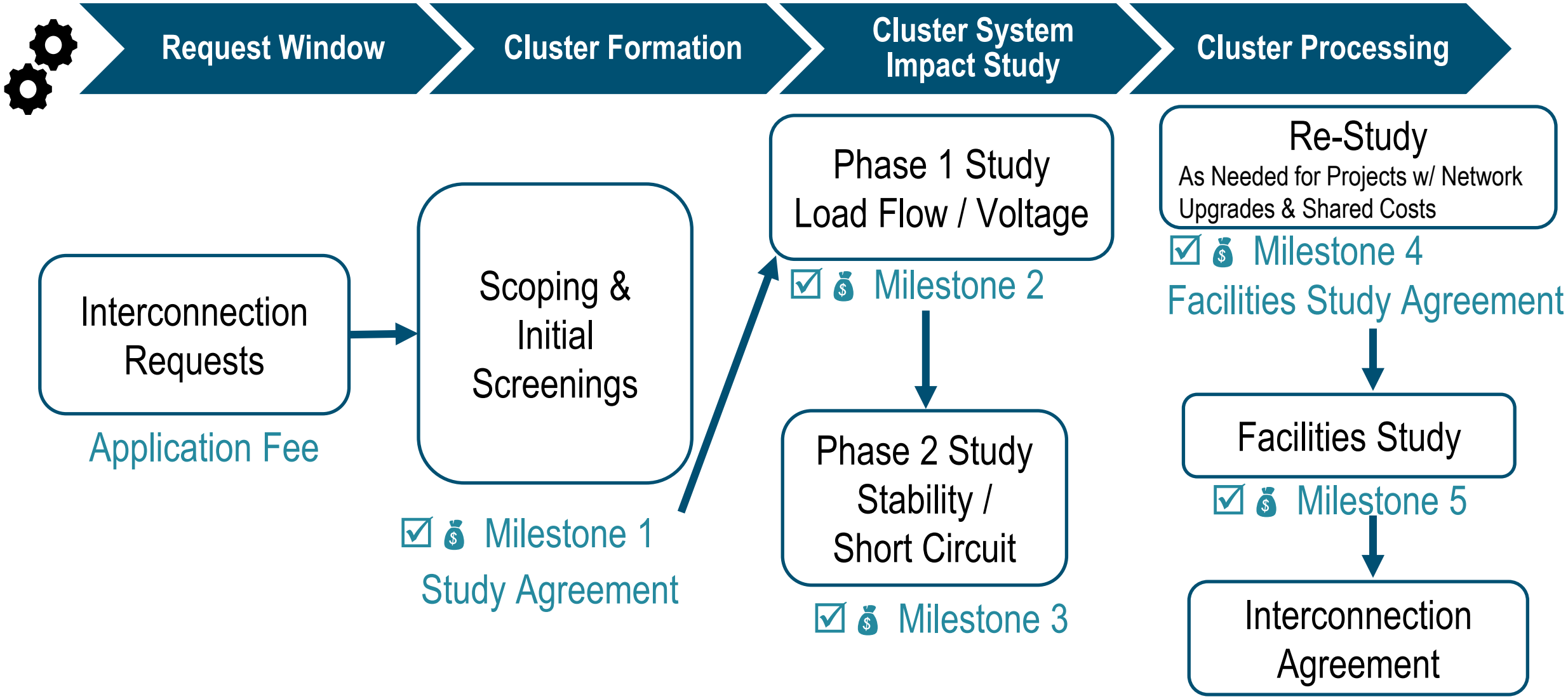
T&D Alignment

- Evaluate the impacts of Distribution connected projects on distribution facilities, providing more streamlined coordination of distribution upgrades
- Develop an improved process for assessing the impacts of Transmission and Distribution connected projects on transmission facilities and provide more efficient coordination of transmission upgrades

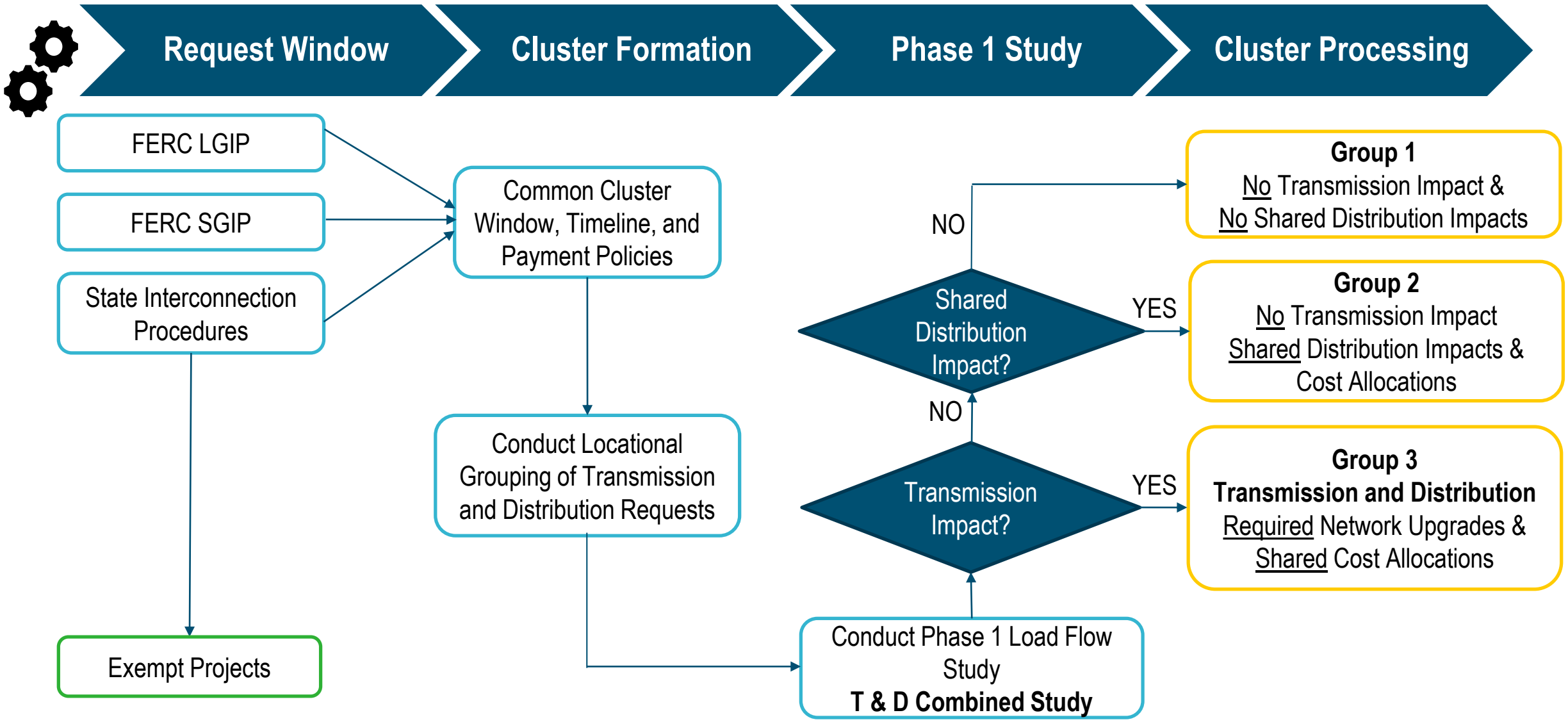
Equitable Cost Allocation

- Equitably assign costs to projects (transmission and distribution) in the cluster study based on the relative impact of a project on a given facility that requires an upgrade

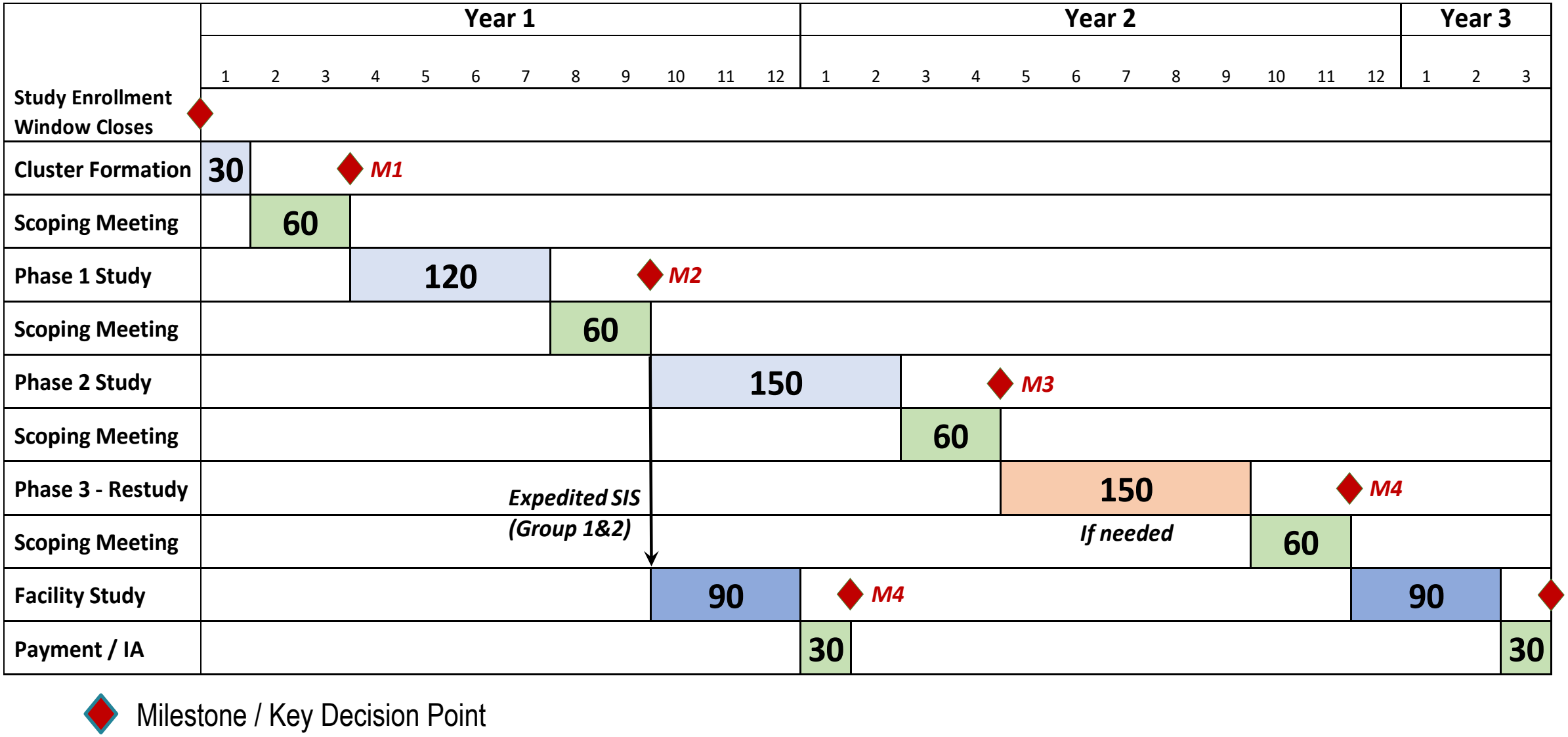
Proposed Future State: Cluster Study Processing



Proposed Future State: Cluster Study Processing (cont'd)



Proposed Future State: Cluster Study Timeline



Milestone / Key Decision Point

Proposed Future State: Cluster Study Milestones

SIS Study Phase	Distribution (D) SIS screen / study	Transmission (T) screen / study	Milestone	Amount
Pre-enrollment	Pre-application info	Pre-application info	App. Fee	TBD
Cluster Formation	Substation / Transformer / Feeder capacity		Deposit / M1	TBD
Phase 1	Transmission Impact Assessment Steady State Voltage Anti-Islanding review	Steady State Analysis	M2	100% D Interconnection Facilities Cost + 30% D upgrade cost + 30% T Network upgrade cost
Phase 2	Protection Study Transformer Inrush	Short Circuit Study Stability Study Restudy Steady State (as needed) Reactive Capability Study	M3	+ 60% D upgrade cost + 60% T Network upgrade cost (less M2 upgrade payments)
Phase 3	Restudy (as needed)	Restudy (as needed)	M4	+ 100% D upgrade cost + 100% T Network upgrade cost (less M3 upgrade payments) (minus M2 & M3 payments)
-SIS Study Complete-				
Facility Study	Detailed Engineering Design	Detailed Engineering Design	M5	100% T Interconnection Cost

Proposed Future State: Transmission Cost Allocation

Network Upgrade Cost

- Each project's **system upgrade cost** will be calculated by multiplying the percentage of the project's impact on the cluster by the total upgrade costs required to accommodate the cluster

Local Upgrade Cost

- If multiple projects in a cluster require interconnection to the same facility, each of those project's **connection upgrade costs** will be calculated by dividing the number of projects using the upgraded facility by the total upgrade cost

Interconnection Facility Cost

- A project's **connection cost** will be the cost for the individual project to interconnect to the Transmission Provider's system

Proposed Future State: Distribution Cost Allocation

Network Upgrade Cost

- Each distribution project's **system upgrade cost** will be calculated by multiplying the percentage of the project's impact on the cluster by the total upgrade costs required to accommodate the cluster (Group 3 projects only)

Distribution System Upgrade Cost

- Each project's **distribution upgrade cost** will be calculated by multiplying the cost of the required distribution system upgrade by the project's requested capacity as a percentage of the total capacity of the group

Interconnection Facilities

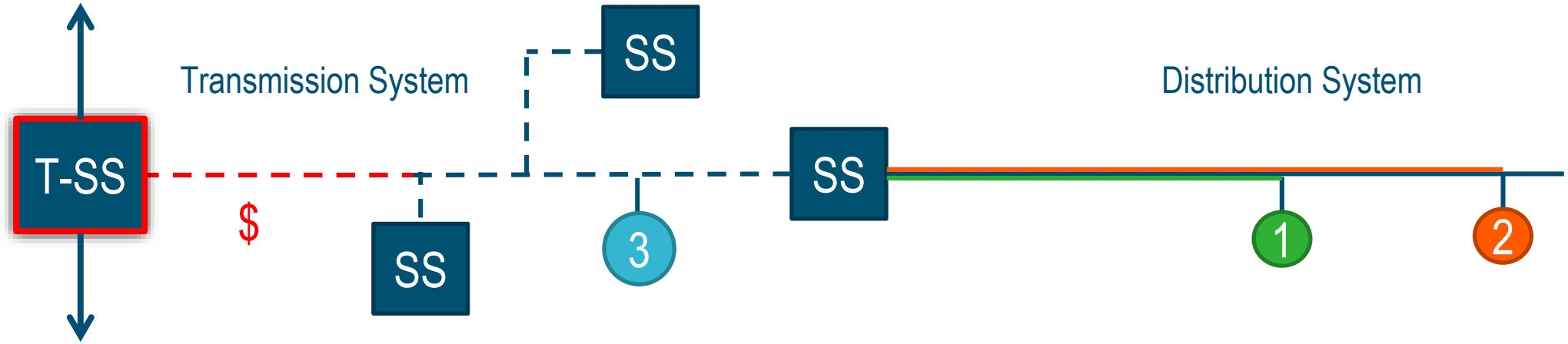
- A project's **connection cost** will be the cost of the individual project's interconnection facilities

Cost Allocation Example

Project	Size (kW)	Upgrade Required	Serial Study Upgrade Cost	Upgrade Required	Grouping Study Upgrade Cost
A	**5000**	None	$0	Reconductor from A to SS	$500k = (5/7*)x$700k
B	**2000**	Reconductor **entire** line	$800k	Reconductor from B to SS	$300k = $100k+(2/7*)x$700k

* Project Size Ratio

Cost Allocation Example – Phase 1 Study Report



Project 1	Facility Contribution	Estimated Upgrade Cost	Milestone 2 Payment
Total Estimated Upgrades		**$750,000**	**$295,000**
Transmission / Network Upgrades		**$150,000**	**$45,000**
-Reconductor 115kV line, x miles	8%	$50,000	
-Transmission 230kV substation upgrade	5%	$100,000	
Distribution System Upgrades		**$500,000**	**$150,000**
-Reconductor 24kV line	62.5%	$500,000	
Interconnection Facilities	100%	**$100,000**	**$100,000**

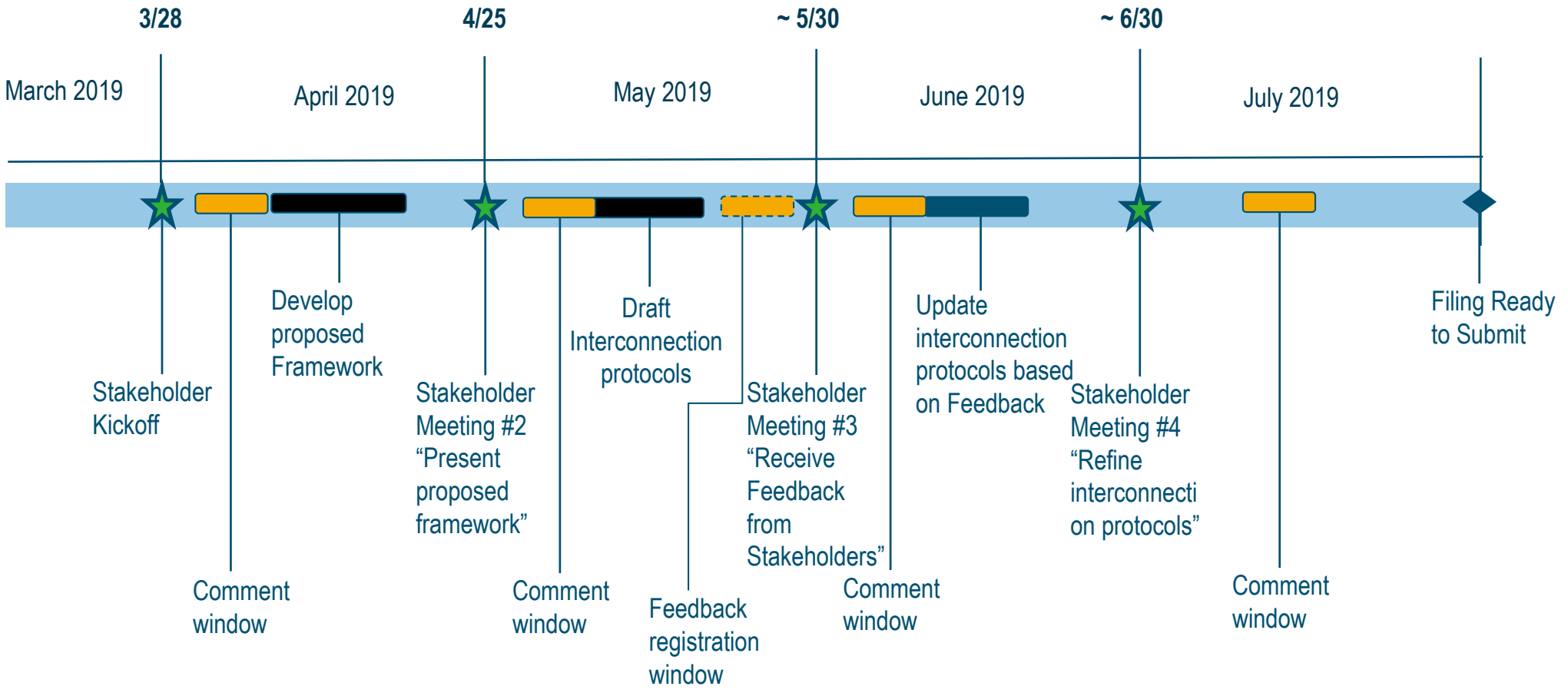
Next Steps

- Address the details on the following topics of Queue Reform
  - Criteria for Network Upgrades
  - Site Control Requirements
  - Financial Milestones
  - Refund Methodology
  - Transition Plan

- Today's presentation will be emailed or posted

- Share the feedback form and QueueReform@duke-energy.com email for stakeholders to provide their written feedback

2019 Queue Reform Stakeholder Process Timeline*



*This timeline may be adjusted based on filing requirements

LUNCH

BREAKOUT SESSION

Breakout Session Guidance

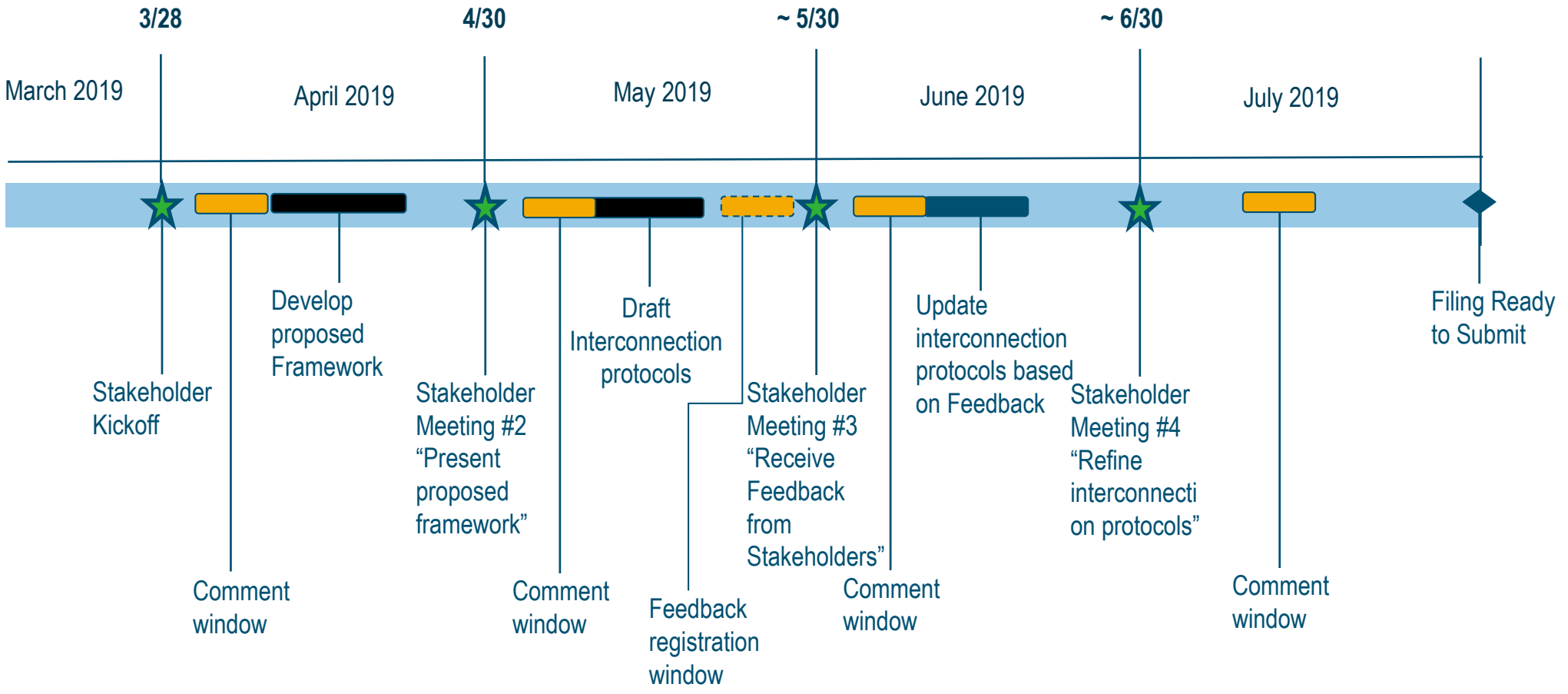
- Purpose: To capture feedback that will assist Duke's ongoing efforts in building a future state framework benefitting stakeholders

- Feedback on the following topics will be captured in today's sessions:
  - Proposed Cluster Study Process
  - Proposed Cluster Study Timeline
  - Transmission Cost Allocation
  - Distribution Cost Allocation
  - Cluster Study Milestones
  - Cost Allocation Example
  - Cost Allocation Example- Phase 1 Study Report

Stakeholder Feedback Form

Topic	Stakeholder	Comments	Proposals

2019 Queue Reform Stakeholder Process Timeline*



*This timeline may be adjusted based on filing requirements